MEDICAL AND PHILOSOPHICAL REGISTER.

VOL. V.....No. I.

FOREIGN AND DOMESTIC.

New Theory of the Tides. Suggested by ROSS CUTHBERT, *Esq. of Lower Canada.*

PREFACE.

WHATEVER in science has been sanctioned by sir Isaac Newton should perhaps be privileged from inspection, and taken for true. But it often happens that human genius, weary as well as proud of success, will seek repose in arbitrary explanations of the phenomena it has found difficult to solve. The cause of the tides, seems in this way to have been ascribed chiefly to the moon's attraction, evidently in consequence of an occasional, but very irregular, correspondence between its changes and the variations of the tides. However, the moon and tides have not the pretended coincidence of change; the experience of every month proves their disagreement; that high water sometimes takes place, even three hours after the time when the moon's supposed disturbing force is greatest;

and low water within three hours of the same period, and even at the same time. The supposition that the gravity and viscidity of water prevents its promptly obeying the moon's force, would be well founded if the moon's changes were sudden. But the moon's progress is slow; and, consequently, had the moon the disturbing force attributed to her, the changes in the waters which partly cover the globe would necessarily be regular: high water would take place precisely when the moon's force was greatest, and would steadily follow the moon in her progress.

The theory admits and requires, that the attraction of the moon, detached and distant as it is from the earth, is sufficient to controul, and therefore greater than, the various opposing forces of, 1st, gravity, whereby the particles of water are drawn and bound to the common centre of the globe of which they form a part; 2dly, the attraction of cohesion, acting mutually on the particles in contact with each other.

It is further assumed, that the waters of the globe are raised in the region immediately beneath the moon and at the antipodes of that region, at the same time; so that the moon attracts one side of the globe, and repels the other.

The sun and moon, in conjunction or opposition, are required to produce the same effect. Thus the sun and moon, acting together on the same radius, on the principle of attraction are supposed to disturb the waters of our globe, in the same way as when the sun is acting in exact opposition to the moon.

The moon's attraction must be a tendency to approach the whole mass of our globe, but not to derange or disunite its parts.

Could the moon's attraction disturb the waters of our globe, one wave or tide only, would perpetually follow the moon; and, instead of two high and two low tides, at each place, in twenty-four hours, there would be but one tide during that time.

Indeed the difficulties met with, in the application of the common theory to the reality, drew from the editors of the Encyclopædia Britannica the following remarks:

"The reader will undoubtedly be making some comparison in his own mind, of the deductions from this theory with the actual state of things. He will find some considerable resemblances; but he will also find such great differences, as will make him very doubtful of its justness. In very few places does the high water happen within three quarters of an hour of the moon's southing, as the theory leads him to expect; and in no place whatever does the spring tide fall on the day of new and full moon, nor neap tide on the day of her quadrature. These always happen two or three days later. By comparing the difference of high water and the moon's southing in different places (and they might have added at the same place at different times) he will hardly find any connecting principle."

But such are the irregularities observable in the tides, that no assignable cause whatever can appear in perfect unison with them; and science will probably have to chuse its solution of their phenomena among plausible probabilities. The theory here suggested is grounded on a principle daily experienced; and, it is humbly presumed, more satisfactorily applied than that on which the common theory is founded.

NEW THEORY, &c.

HEAT, or, as called by chemists, caloric, whether a substance or quality, expands whatever it pervades; and this effect is the same, whether caused by the sun's presence, by friction, or otherwise*.

Besides a variety of particular experiments, daily experience demonstrates the expanding force of heat. In proportion to the degree of heat present, the mercury in the thermometer swells and rises in the tube, and shrinks and retires in proportion to the diminution of heat. Water in a kettle, placed over a fire, is seen to boil up to double the original volume, and, on being removed, to return to its first dimensions.

As fluids are composed of particles without continuity, and whose adhesion is feeble, they are more sensibly affected by the presence of heat than solid substances. The same degree of heat that would produce a scarcely perceptible expansion of a bar of iron, would cause a quantity of water, which but half filled a kettle, to boil over, and would raise the mercury of a

* Although few things are more generally known, than that heat expands whatever it pervades, the following account of this effect is cited in explanation:

"The principal effect of heat is to augment the volume of all bodies, without adding to their weight. In general, every body in nature is dilated by heat, and all mineral substances, without exception, experience a dilation which is greater the more intense the heat. Philosophers have made an experiment with a cylinder of metal fitted to an orifice in a metallic plate, so as just to pass through it when cold, and they find that the same cylinder, when heated, could not pass. It is therefore established that bodies expand by heat, and that their dimensions are enlarged in all directions." Elements of Chemistry, by M. de Fourcroy, article Heat.

thermometer several hundred degrees, if sufficiently long to admit of such a range; also, that degree of heat which will raise mercury 10° will raise spirits of wine 12° or 13°. The latter fluid recedes farther from a state of solidity than the former.

The sun emits a perpetual flood of heat in all directions, and mingles with and swells the waters which cover the globe.

EVAPORATION.

It cannot fail to be objected, that, notwithstanding the sun's heat generally dilates all matters within its reach, yet, in regard to fluids, the presence of heat tends chiefly to raise portions of them into vapour. The objection is well founded in regard to small quantities of fluid: for instance, a bason of water. In this case, the rays of the sun are reverberated from the sides of the bason, and the diffusive motion of the heat being only upwards, the particles of the water are soon dispersed.

Not so with the vast oceans that cover the globe. The sun's rays penetrate to, and spread unconfined throughout, their deepest regions, and the diffusive motion is perpetually downwards, but, as it proceeds, becomes more and more feeble, and too faint to admit of reverberation from the bottom.

Evaporation is slower, in proportion to the greater bulk of a fluid, the forms being similar. To prove this, two tin vessels, whose forms were similar, and capacities to each other as five to one, were placed on the top of a stove equably heated. During the time the water evaporated from the vessel which was as five, the vessel which was as one was filled up six times,

and was six times emptied by evaporation. One sixth part more water than the larger vessel contained was dispersed from the smaller vessel, in the same time, and by exactly the same agent.

Evaporation is slower, also, in proportion as the volume of fluid is more collected. The water shed by a cloud, when scattered over a plain, is dissipated in a period of time incalculably shorter than an equal quantity would be if collected in a pond. In the latter condition, the heat has liberty to range; in the former, the heat, arrested by the earth, and reflected therefrom, suddenly carries off the particles of water. Indeed, if each drop of the water which composes an ocean could be carried off by the sun with as much speed as a single drop cast on a solid body, it probably would require but a few days to empty the Atlantic Ocean, were the atmosphere capable of receiving it, and the land sections of the globe would have to sustain an uninterrupted deluge from above.

Two tin vessels of cylindrical form, whose diameters were equal, but whose heights, and therefore capacities, were to each other as ten to one, the height of the former being equal to its diameter, were placed on a stove equably heated. During the time the water evaporated from the vessel which was as ten, the vessel one, was emptied eighteen times; so that, in the same time, about half the quantity of water only was carried off from the deeper vessel, that was carried off from the other.

Two tin vessels of equal capacities, but whose depths were to each other as two to one, were placed as above. The vessel which was but half the depth of the other, but which never-

theless contained an equal quantity of water, was emptied in a decidedly less time.

Since, then, by these simple experiments it appears, the degree of heat being the same, evaporation diminishes with the increase of the volume of a liquid, and the more collected its form; it is concluded that, in such enormously extensive bodies of water as the oceans are, evaporation must almost cease.

This conclusion is farther supported by facts. It may be generally stated, the more remote from land, the more serene the sky. Mariners going to sea, look for good weather; approaching land, they expect foul. The Pacific Ocean, the longest uninterrupted body of water, is unobscured by a cloud for months together, and from this circumstance derives its name. The atmosphere is generally clear over the Atlantic Ocean, even during seasons when the neighbouring countries are enveloped with fogs or clouds. The sun's heat, confined and checked by the solid surfaces which land presents, is spent in dissipating and diffusing the small bodies of water, which, in the form of swamps, lakes, and rivers, may be lodged or running on the face of a country; and the more frequent such bodies of water occur, the more is the ambient sky loaded with vapour.

But, notwithstanding it be admitted evaporation constantly takes place from the waters which cover the globe, a small part only of the sun's heat is engaged therein, because,

1st. The progress of the sun's heat is so rapid and constant, that the employment of it by evaporation is too slow to prevent the farther action of the sun throughout the whole extent of the water. Thus the heat of a fire acts so powerfully on water

placed in a kettle, as to swell the water considerably at the same moment that it is losing much by evaporation. This experiment is made every day in every kitchen, and is a correct though violent representation of the periodical swells of the oceans caused by the action of the sun.

2d. Because the capacity of the atmosphere is limited, and can receive but a limited quantity of vapour, and because the sun's heat is infinite when compared to the capacity of the atmosphere. The infinite remainder of the sun's heat unengaged in evaporation, necessarily pervades and mingles with the waters of the oceans, and thereby augments their volume.

The atmosphere has a limited capacity. It can admit, in the form of vapour, only a certain finite quantity of water. When charged to its utmost capacity, evaporation must cease. It is probable the atmosphere is at all times nearly charged to its utmost capacity, because the extent of water, which is the material, and the sun the agent, are constantly the same, and constantly employed in maintaining that utmost charge. The continual changes in the atmosphere only, prove that an infinitely various distribution of nearly an equal quantity of vapour is taking place, every where and at all times. Some regions of the atmosphere are receiving water, while from other regions it is returning. This is not made less probable by the long continuance of clear weather, since the atmosphere often acquires a condition which refuses evaporation. The long duration of clear, dry weather, at times, when the same causes of evaporation are in force that loaded the atmosphere with vapour, furnishes a sufficient proof. For two, three, or more weeks, the sky often continues calm and clear, and free from dew, beneath a vertical sun. It follows, that at those periods the atmosphere refuses the vapour constantly offered by the

action of the sun; or, what seems more probable from the above-recited experiments, the sun, in regard to very large bodies of water, is little employed in evaporation, but chiefly in dilating their volume.

The gentle evaporation that may take place from the oceans does not affect their height. They being co-extensive with the atmosphere, whatever quantities of water the atmosphere may acquire in the form of vapour, by the action of the sun, in some places, are in other places returned into the oceans, directly in the form of rain, or indirectly by the channels of rivers and rivulets. And this routine of evaporation and rain, it is certain, keeps up a steady balance of accounts, since the high and low water marks, through successive centuries, remain the same in all places: so that, from the natural tendency of liquids to gain a state of equilibrium, and the various oceans communicating one with the other, it follows, the waters which cover the globe would remain in a state of undeviating height, were they not otherwise influenced by the expanding power of heat.

It is not to be supposed, the action of the sun on the waters in high latitudes produces the changes there, *e. g.* the English Channel. The sun's heat may be said to act as a percussive force, and to give a periodical stroke to the great bosom of the ocean over which the sun passes vertically. The changes of the water along the shores are the effects of the impulsion given to the central regions of the oceans; and the farther the shore, to a certain extent, the greater the change. Impulsion is adopted instead of swell, to render the idea more distinct. Each swell moves off in a wave; and, the greater range it takes, the higher the undulation. This will appear by dipping the hand in an oblong tub, full of water, nearer to one end than the other:

the rise of the water will be considerably greater at the end most distant from the stroke. And this may account for the greater height of the tides in middle latitudes than near the line. The undulation is exhausted in its progress towards the poles.

EXPLANATION OF THE PHENOMENA OF THE TIDES.

The sun's heat pervades one half of the surface of the globe at all times; and by the periodical visitation of the various oceans by the sun, in consequence of the diurnal rotation of the globe, periodical swellings are produced in those oceans, which exhibit all the phenomena of the tides.

The waters contained in any given tract of the globe, for instance, the Atlantic Ocean, are exposed to, and receive the sun's heat once in twenty-four hours, in consequence of the diurnal motion of the earth. Let the sun be on the line: the nights and days will be equal, and the sun will rise at six o'clock. The moment the sun rises, its heat begins to sink into the ocean; as the sun ascends, the heat becomes greater, its intrusive, pervading, and expansive force greater, until it reaches the zenith, and the gradual augmentation of the water by the immersion of heat during this time, will exhibit a flood tide along the edges of the shores in contact with the ocean. It will be noon, and six hours will have elapsed. As the sun gradually declines westward, there will be also a gradual secession and escape of the heat from the ocean. The ocean, thus insensibly abandoned by the heat, will consequently shrink, and exhibit along the shores an ebb tide. At six o'clock in the evening, the sun having set, and the heat altogether vanished, low water will take place. During this first solar day of twelve hours, there will be one flood tide and

high water, and one ebb tide and low water: one rise and one fall of the water.

This rise and fall, having disturbed the edges of the ocean, or where the ocean is in contact with land, a re-action will ensue; but, in consequence of the gravity and viscidity of water, it will be performed in rather a longer time than the first swell, which is the cause.

The first re-action would be followed by others; and were the sun, the original agent, to disappear altogether, nevertheless a vibratory tide might endure for ages. This will appear extremely probable, by the effect produced by dipping a hand in a bason of water. The first rise and fall will be followed by a similar rise and fall, and a vibration will ensue for some time along the edge of the vessel. A stone thrown into a pond of water, will occasion the shore to be lashed for a considerable time by successive equal re-actions of the water, although the water received originally but a single impulse from the stone. The longest calms are scarce sufficient for the ocean to subside to a state of rest. When it most approaches to, or for a while really acquires, a state of quiescence, a ceaseless rise and retrocession of its waters continue along the shores which confine it, commonly called surf.

In consequence of the re-action which follows the original rise and fall of the waters of the first day, occasioned by the sun, the first night will exhibit a repetition of the tides of the first day. From six o'clock in the evening, being sun-set, the waters will rise till midnight. At midnight (or a little after, in consequence, as above stated, of the gravity and viscidity of water) there will be high water. From midnight until some time past six o'clock in the morning, ebb tide will take

The change of seasons cannot alter the supposed action of the sun on the oceans, as its heat constantly strikes a hemisphere of the globe. Whether the sun is considered to be on one side of the line or the other, it is immaterial; since the oceans, extending on each side of the line to the poles, must continue to receive the sun's heat. Could it be possible that the half of the globe, on which the sun shone at any given time, was masked by clouds, the sun's heat would nevertheless reach the waters thus hidden. Heat is so diffusive, that the most dense bodies check it only for awhile: it therefore cannot be supposed that vapour can materially check its progress. The mercury of a thermometer will rise in the shade. However, interventions of this kind may cause some of the caprices of the tides.

It may be objected, that, during the night, the atmosphere often continues warm, and that this heat must prevent any distinct effect from the sun's presence. But the warmth experienced after sun-set, is evidently the heat escaping from the surface of the globe, accumulated during the day; since the warmth equally diminishes, and towards morning the atmosphere becomes cool. The diminution is more rapid over water than land, because of the less resistance given to the escape of the heat, in consequence of the less continuity of the particles of fluids than of solid bodies.

Analysis of Dr. Willan's "Description and Treatment of Cutaneous Diseases. Ord. 3. Rashes. Part 1st," &c.

The description of rubeola or measles, though perhaps more minute from the necessity the author felt of peculiar accuracy,

cannot be materially different from our best writers on the subject. However, there are a few facts which are better established than heretofore. The first of these is the period after receiving the infection, when the symptoms commence; and, secondly, the period after such commencement, before the eruption shows itself. These, with the varieties to which they are liable, are accurately traced. The period after exposure to the contagion, before the fever commences, or, to use Mr. Hunter's words, the period of the disposition to the disease before its visible action commences, is usually from the sixth to the tenth day. The period of eruption after fever is from the third to the sixth day. Those who are less susceptible may continue for a long time communicating with the sick; but the contagion does not act upon them unless the body be brought into a feverish state by some accidental cause, as, by taking cold, by watching, fatigue, or mental suffering. "I do not recollect," adds the author, "any person wholly unsusceptible of the disease after repeated exposure, as happens in small-pox in a very considerable proportion." But if all are susceptible of the disease, it follows that all must feel ultimately the effect of the contagion if exposed to it, even though the body should not be brought into a feverish state by any other cause. May we not therefore be allowed to doubt whether the deranged actions in the constitution from these other causes, may not have produced this protraction of the disease? That such a cause will protract the appearance of the rash, the author shows by a case, the periods of which he had an opportunity of marking with particular accuracy. He afterwards reduces it to a general law: that, "when a person who carries about him the contagion of the measles, gets a catarrh, or becomes feverish from the causes mentioned above, the contagion begins to operate about the fourth day of such a fever, and then excites fresh paroxysms, which after four days

terminate in the eruption. Hence the febrile stage in this instance appears to have the extent of eight days."

Now it is well known that the common period of the acute state of catarrh is about four days. From that time, if the patient is not well, he is at least convalescent, and complains more of the effect of his *cold* than of the disease itself. Is it not therefore probable that the action of measles has been suspended by this new action, that is, the catarrh, after the impression has been received from the contagion; and that when this action from the supervening catarrh, has been completed, that of measles commences, and goes through its usual progress? We are led to offer these suggestions to our ingenious author from the following very valuable history.

"I inoculated about the same time three children with the fluid contained in these vesicles, but no effect was produced by the inoculation. A similar trial at the Inoculation Hospital proved more successful. Richard Brookes, aged eighteen, was inoculated by Mr. Wachsell, with fluid from the miliary vesicles in measles, and with vaccine virus, January 6, 1800. On the 10th there was some redness and elevation of the cuticle at both the inoculated places. 15th. The redness round the part where the lymph of the measles was inserted had disappeared, while the vaccine pock was vivid. 18th. The vaccine disease was over. 22. He had severe cough, sneezing, and watery eyes, with cold shiverings and fainting. 28th. The measles appeared; his eyes were inflamed, and the lids swollen. 29. The efflorescence was diffused all over the surface of the body; frequent cough; violent fever. Feb. 1. Efflorescence disappeared; cough and fever much abated. From that time he recovered gradually, and was dismissed in health on the 12th of February."

We have copied this passage not only as an instance of successful inoculation for measles, but also as an illustration of our opinion concering the causes of the protraction of the disease after the contagion has been received. Here we find the subject susceptible of the two contagions at the same time; and, as long as the diseased actions were local, both went on at the same time. But as soon as the constitutional action from vaccination commenced, the local action of measles ceased. When the vaccine process was completed, the rubeolous recommenced, and in four days afterwards the cough, sneezing, and other symptoms previous to the eruption came on. In six days more the eruption appeared, and in four more disappeared; making in the whole twenty-six days, a fair allowance for the two diseases. We would not be supposed in this examination to question Dr. Willan's accuracy or his abilities; we have fairly stated the question as it appears to us, and leave the decision to our readers.

After a very accurate description of the disease in its most usual progress, the author enumerates some of the anomalous appearances remarked by himself and other writers. We shall transcribe his own, not only on account of their importance, but because they lead to the solution of a difficulty which no one has ventured to touch upon with so much boldness before.

" Some other appearances which occasionally succeed the measles likewise demand attention. These are, 1st. Small hard tumours, like boils, being in the beginning very much inflamed, and sometimes of a livid colour, afterwards suppurating with great pain, and a sanious discharge. They appear mostly on the back, loins, or lower extremities, and are not readily healed. In children there is an analogous eruption of

inflamed pustules (Phlyzacia, DEF. X. 1.) on different parts of the body, but particularly on the feet, legs, thighs, and scrotum.

" 2dly. An eruption round the chest, about the mouth, temples, &c. of watery vesicles, in clusters, with an inflamed base, producing much heat, pain, and tingling of the skin.

" 3dly. In infants aphthous ulcerations of the tongue and fauces.

" 4thly. Soft pustules containing a viscid, straw-coloured fluid (Achores & Favi, DEF. X. 3.), on the head, face, breast, and thighs, succeeded by ulcerations at the corner of the mouth, with tumour of the upper lip, sore eyes and ulcerations of the tarsi, discharges from behind the ears, enlargement and tedious suppuration of the submaxillary, occipital, axillary, and inguinal glands, sometimes with pain and swelling of the joints.

" 5thly. In some cases where no eruption of pustules, nor superficial ulcerations have preceded, the lymphatic glands of the neck and other parts become considerably enlarged; this appearance is succeeded by a swelling and tension of the abdomen, with hectic fever and emaciation.

" I never saw the rubeola terminate by gangrenous ulcers of the throat, cheeks, gums, &c. or by caries of the jaw-bones, as stated in several respectable authors. Those dreadful symptoms more especially belong to another disease of the present order."

We shall pursue this important enquiry without interruption.

"It may be proper," says our author afterwards, "to notice the 'putrid measles,' observed by the late sir William Watson among the children at the Foundling Hospital, in 1763 and 1768; see Med. Observ. vol. 4. In this disease there was a cough and watery inflamed eyes, but 'the eruption appeared, over nearly the whole body, on the second day;' the fauces were of a deep red colour; the pulse was very quick, but low; the patients complained of extreme weakness, and could not bear bleeding; their oppressed and difficult breathing was attended with great restlessness and anxiety, but with scarce any expectoration throughout; some died under laborious respiration, more from a dysenteric purging; several were so debilitated that they refused to take almost any nourishment, and sunk quite emaciated, one so late as six weeks after the attack; some cases terminated in mortification of the rectum, pudenda, cheeks, gums, &c. others with caries of the jaw-bones.' These circumstances do not belong to the rubeola, or measles generically considered; they are, indeed, ranked otherwise in sir W. Watson's own statement respecting the disease, which he refers to the morbilli maligni, or epidemii, described by Morton. Now, it must be observed, Dr. Morton expressly maintains that the measles and scarlatina are the same disease, with no more variation in their form than there is between the distinct and confluent small-pox; he has therefore conjoined their principal symptoms (cap. iii.) and wishes to banish the distinction, and the very name of scarlatina from medical language. In this wish Dr. Morton has not succeeded; hence those readers who attend, not to the names of things, but to the things themselves as described, will find that the morbilli maligni, morbilli epidemii, morbilli spurii,

and febris morbillosa, pestilentialis, in his writings, have no relation to the measles, but constitute the disease to which other writers have given the titles of angina maligna, ang. epidemica, ang. pestilentialis, ang. ignea, scarlatina anginosa, scarlatina maligna, &c. &c.

" Sir William Watson probably first adopted Dr. Morton's opinion, and nomenclature, about the year 1768; see Med. Obs. IV. p. 133. In 1763, his technical terms seem to have been different; he says, Med. Observ. p. 136, ' the first person seized with the epidemic measles was on April 21,' but in the weekly report of the sick to the Hospital Committee, and in the apothecary's book, this case is denominated ' eruptive fever.' The two other cases, said, Med. Obs. p. 137, to have occurred between April 21 and May 4, are not entered in the written books under the denomination of ' measles;' one is termed ' eruptive fever,' the other ' scarlet fever.' From these sources one hundred and eighty children were soon affected with the disease in question, every case of which is termed ' eruptive fever,' no mention being made of measles in the report-book till the latter end of November, when ten cases are entered under the name of ' morbillous fever.' This, however, had no connexion with the preceding ' eruptive fevers,' which, according to the printed account (p. 137), wholly ceased on June 9*. In 1766 many of the foundling children,

" * Sir W. Watson's statement has led several persons to suspect, that, from the virulent symptoms of a disease alway imputed inflammatory, there must be something amiss in the state of the air, the diet, or general management of the children of the Foundling Hospital. For this suspicion there is no ground. The regulations remain nearly the same as first framed by the governors, yet their active and intelligent physician, Dr. Stanger, informs me that the measles, during the last twelve years, have never appeared in any other form than as described by Sydenham; and, though frequently occurring there, that they have not been fatal beyond the usual proportion. Thus, in

particularly those placed at Westerham Hospital, in Kent, are said to have been affected with ' eruptive fevers and sore throats,' a title not afterwards employed. The measles appeared among the children of the Foundling Hospital at the beginning of March, 1770, and continued some time. In May, the scarlatina and measles seem to have occurred together, and to be distinguished, according to Dr. Morton's nomenclature, as follows: ' measles,' ' measles and sore throat' or ' measles and ulcerated sore throat,' and measles with ' putrid fever.' The denomination ' scarlet fever and sore throat,' first occurs in the weekly report, Sept. 1, 1787. About the same time, in the prescription book appropriated to the measles, a separate entry is made of scarlatina, this generic title being at length applied, when the disease, after a dreadful ravage during two successive years, had fully impressed the inhabitants of London with a knowledge of its distinctive character, and peculiar virulence."

We shall make no apology for this long quotation on an enquiry leading to so important a discrimination. Dr. Willan's arguments seem almost conclusive, and it is impossible not to admire his industry in following the question so closely. But we cannot help also expressing our surprize when he tells us, that measles have not been fatal at the Foundling beyond the

the year 1798, twenty-five boys, and forty-four girls had the measles; six of the latter died. In autumn, 1800, twenty-nine boys, thirty-seven girls were affected, and four boys died of the disease, or its consequences. In 1794, twenty-eight had the measles, and all recovered. In 1802, one died out of eight children affected. Particular cases may occur wherein symptoms of putrescence appear during the latter stages; (p. 237). Of such cases I have only noticed five, in a practice of twenty-four years: many practitioners, who have been established fifty years, have not seen them in a greater proportion; I never yet conversed with any one who had noted putrid measles occurring epidemically."

usual proportion; when by the register, it appears that at two periods taken collectively, about one in thirteen died. Surely, such a mortality as this is beyond the common ratio in this disease. The question is carried much further than our limits will permit us to pursue it, but not further than every diligent enquirer will wish to accompany our author. This part of the work concludes with some short but pointed remarks on the low state of Saracenic or Arabian medicine, even when in its highest reputation.

Med. and Phys. Jour. v. 14. *p.* 362.

On Inoculation of the Measles.

We transcribe the following remarks on inoculation for the measles, as a subject hitherto not mentioned in our work. "The great success which attended inoculation for the small-pox," Dr. Wilson observes, "induced many to believe that similar advantage might be expected from it in the measles. The very prevalent opinion of its being received in the natural way by the lungs, and the lungs being the chief seat of danger in this disease, seemed rather to strengthen the opinion. Dr. Home, of Edinburgh, however, was the first who actually made the experiment.

"He met with some difficulty from the measles not forming matter, and his not being able to collect a sufficient quantity of broken cuticle, at the time of desquamation, to produce the disease. 'I then applied,' he observes, 'directly to the magazine of all epidemic diseases, the blood.' He chose the blood when the eruption began to decline in patients who had a considerable degree of fever. He also ordered it to be taken

from the most superficial cutaneous veins where the eruption was thickest.

" While the blood came slowly from a slight incision, it was received upon cotton, and on an incision being made on each arm of the person to be inoculated, the cotton, as soon as possible after it had received the blood, was applied over these incisions, and kept upon them, with a considerable degree of pressure. He also used the precaution of allowing the incisions of those to be inoculated, to bleed for some time before the cotton was applied, that the fresh blood might not wash away, or too much dilute the morbillous matter. The cotton was permitted to remain on the part for three days. How far all these precautions are necessary to the success of the operation has not been determined.

" Dr. Home inoculated ten or twelve patients in this way, in whom the operation succeeded equal to his hopes. The eruptive fever generally commenced six days after inoculation, and the symptoms of the complaint were milder than they generally are in the casual measles. The fever was less severe, the cough either milder or wholly absent, the inflammation of the eyes was trifling; they watered, however, as much, and the sneezing was as frequent, as in the casual measles; nor did bad consequences follow any case of inoculated measles: no affection of the breast remaining after it. The chief difference between the casual and inoculated measles seemed to be, the absence of any pulmonic affection at all periods of the latter.

" Dr. Home now regarded it as ascertained, that the natural measles are received by the lungs, and that on this circumstance depends the danger of the disease. He wished, however, to ascertain the symptoms of the complaint when evidently re-

ceived by the lungs. He therefore put a piece of cotton, which had remained in the nose of a patient under measles, into that of a healthy child, making him breathe through the infected cotton. The experiment, although repeated, did not succeed in inducing the disease. Nor, it is evident, if successful, would this experiment have decided the question whether or not the casual measles are received by the lungs. Dr. Home's experiments have not met with the attention they deserve. In scrophulous habits, particularly, it would certainly be worth while to try his mode of inoculation. If a more extensive experience prove it capable of producing the effects ascribed to it, it will certainly be an improvement of considerable importance."

Med. and Chir. Rev. vol. 7. p. 375*.

History of Diseases, &c. from Ancient Authors.

NO. I.

The Editor presumes no apology is necessary for commencing the introduction of a series of papers on diseases, as given by our ancient medical authors:—It is believed that it will prove acceptable to many (who have never had an opportunity of perusing their works, either translated or original), to compare the accounts they give of the disorders which came under their notice, and their method of treatment, with the observations of the physicians of the present day.

We shall commence these papers from Aretæus, from the translation by Dr. John Moffat, from the original Greek, of his

* From Wilson's "Treatise on Febrile Diseases."

"eight books, on the causes, symptoms, and cure of acute and chronic diseases."

Aretæus was a Cappadocian, though the period of his life is uncertain; he lived, however, before Paulus Ægineta, who flourished in the seventh century, for he quotes him, and his writings are thus eulogised by Mittaire, in a letter to Dr. Friend: "His accuracy is so great that you would imagine he painted and did not write, you would think you did not feed the eyes with an empty picture, but that you were present with the persons afflicted, beheld their various labours, heard their cries, groans, and sighs, that you felt yourself affected with horror, and moved with pity, in proportion to the distresses with which they were affected." Motherby says, "in picturesque accuracy, he surpasses all others among the ancients, except Celsus, who is called the Latin Hippocrates;" and our translator (Dr. Moffat) considers him as "the head of all the ancients, Hippocrates not excepted, both in respect of matter and elegance of diction."

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THE TETANUS*.

Tetanus is a spasmodic affection of the muscles belonging to the maxillæ and the tendons, accompanied with severe pain, frequently with sudden death, nor does it easily admit of a remedy. The distemper is communicated to the whole frame, and every part partakes of the original affection.

There are three different species of this convulsion: the first is, when the body is extended; the second, when it is bended backward; and the third, when it is curved forward.

* Chap. I, book I.

The first takes place when the patient is stretched out in one direct line, and cannot be made to incline either to the one side or the other. The other two are easily known and distinguished from the mode of tension and situation of the person affected: hence we call the reflection backwards *opisthotonos*, the nerves on the back parts being chiefly affected; but if the patient is bended forwards, it obtains the name of *emprosthotonos*, from the affection of the nerves on the anterior parts: the name thereof originates from the tone of the nerves and the mode of tension.

They arise from an infinite variety of causes; from wounds, a puncture of the membranes, muscles, or nerves, and in such cases they generally prove mortal, especially that which arises from a wound.

When this affection arises in women from abortion, they seldom survive; some are seized with this convulsion from a violent stroke in the neck, and not unfrequently a severe cold serves as a cause: on this account winter especially produces affections of this nature, and next to it the spring, with the autumn, but the summer least of all, unless a wound or the raging of some epidemic distemper has laid a foundation. It is observed that women are more liable to this disease than men, from the frigidity of their system, but they more frequently survive, from their inherent moisture.

With regard to the different periods of life, children are much harassed with it, but they are not so subject to die, because the disease is, as it were, domestic and familiar to their constitution. Youth suffers less, but among them death is more common, manhood least of all, but old age is of all other periods the most liable to the affection, and death is more fre-

quently the consequence; for frigidity and the want of moisture, inseparable from old age, likewise the peculiar nature of death, operate as causes. If humidity is conjoined with frigidity, these spasmodic contractions are less hurtful, and attended with much less danger.

The concomitant symptoms of this affection are the following: its attack is sudden and instantaneous upon all, there is a pain and tension of the tendons, both of the back and muscles of the maxillæ and thorax. The under jaw is so closely locked to the upper, that it is not easy to separate them, either by levers or wedges; and if any one, by forcing the teeth asunder, should instil a liquid of any kind, they do not swallow but throw it back, either holding it in the mouth, or rejecting it by the nostrils. The isthmus likewise adheres closely, being shut, and the tonsils, obdurated and tense, will not yield to the compression of what is to be taken down. The face is red, variegated, the eyes nearly fixed and stiff, can only with difficulty be made to roll, suffocation is violent, respiration vitiated, with a distension of the hands and legs, the muscles vibrating, the whole face variously distorted, the cheeks and lips quivering, the maxillæ vibrating, and the teeth gnashing; in some the ears are likewise perceived to move; and I have indeed with astonishment beheld the urine suppressed to a violent degree of strangury, or spontaneously flowing upon the pressure of the bladder.

These symptoms are common to all the genera of spasmodic convulsions, but each has its distinguishing and peculiar marks.

Tetanus, which is a distension of the body in a straight line, holds it in one fixed invariable posture, flexible neither to the

right or left; the legs and hands are likewise kept in the same position.

But *opisthotonos* bends the patient backward, so that his head reflected is placed between the scapulæ, his throat stands out, and the inferior jaw for the most part is separated and but seldom unites with the upper, his breathing is deep, attended with startings, his belly and thorax prominent, with incontinence of urine, the abdomen tense, and when beat upon resounds, the hands when extended are twisted backward, on the contrary the legs and hams are vitiously curved in an opposite direction.

If *emprosthotonos* takes place, the back of the patient is convex, and the haunch bones being thrust from their sockets, are opposed equally to that part of the breast, which the Greeks call *mataphrenon*, the spine draws to a straight direction, the vertex and head fall downward inclining to the thorax, the chin is fixed upon the sternum, the hands are clasped, and the legs extended.

The pains of all are violent, and their suffering intolerable; the voice is sad and mournful, accompanied with sighs and deep muttering; but if the disease seizes the breast and respiration they have an easy exit from life: it is indeed a fortunate event for the person thus miserably afflicted to be liberated from his pains and unseemly distortions; it is likewise a relief and happiness to all that are present, even the nearest relations, whether a son or a father. But should the strength still suffice to protract life, and the breathing, although vitiated, yet continue, they are not only bent in the manner of a bow, but their figure resembles that of a sphere, so that the head is pent

between the knees, the posterior parts of the legs are refracted to the anterior, and the knee joint seems to be forced upon the ham.

This exhibits an inhuman calamity, an unpleasant sight, and a spectacle truly lamentable to behold; but the malady is incurable, and the distortion so great that they are not known even by the nearest relations. It is now a becoming and an excusable prayer in all bystanders, however impious formerly, that the patient may depart this life, in order to be liberated from his excruciating pains and bitter misfortunes. Nor can the physician standing by and looking on be of the smallest assistance, either to life, to relieve from pain, or even to recover his former shape, for should he attempt to straighten the limbs, he tears and distracts the miserable, and now no longer able to contribute to those fettered by the disease, he only adds to their torment, which is truly the greatest calamity and misfortune that can possibly attend the physician.

THE CURE OF TETANUS.

It is necessary, in the cure of this disease, that the bed should be soft, pleasant to the touch, smooth, sweet, and warm, for the nerves become inflexible, hard, and stiff from the disease, besides the skin through its whole extension is squalid and rough, the *palpebræ*, naturally versatile and easy of flexion, scarcely cover the eyes, the eyes are fixed and convoluted at bottom, moreover the joints are immoveable from their tension; the habitation of the patient must likewise be warm, and in summer not so as to provoke sweat or resolution of the nerves, because the disease has a tendency to *syncope*. It is likewise necessary not to defer putting in practice the other principal remedies, especially as there is no time for delay; whether therefore *teta-*

nus arises from cold without any manifest cause, from a wound, or abortion, it is proper to let blood in the arm, taking great care that the compression of the bandage is easy, and that the aperture be made gently and with dexterity, because they are apt to excite convulsions; the patient ought to be blooded once in a moderate degree, not so as to produce *deliquium animi* or cold of the extremities, nor should he be emaciated from hunger, because hunger induces cold and dryness; his drink should be mulse thickened without any mixture, and the cream of *ptisan* with honey, for these excite the least pain and compression of the tonsils, they are smooth and very easily taken down, very efficacious likewise in softening the belly, and very powerful in recruiting the strength. The whole body must be wrapped in wool moistened with gleucine oil, or the oil of saffron, in which either rosemary, fleabane, or mugwort has been boiled, and every thing ought to be very warm to the touch; it should likewise be anointed with ointment made from *limnestis*, a marshy concretion, *euphorbium*, *nitre*, and *pellitory*, with an addition of a considerable quantity of castor oil; besides it will be proper to cover the tendons with wool, and to anoint the parts about the ears and chin, for these suffer grievously from the distension; the tendons too ought to be fomented with light fomentations, and the bladder with small bags containing millet seed roasted, or with bladders of oxen half full of warm oil, which should be applied along the whole extent of the places to be fomented. Sometimes necessity obliges to foment the head, but it is neither salutary for the senses, or nerves, because it suffuses the senses with a mist from the cloud of vapour which ascends, and affects the nerves. Wherefore the safest mode of fomenting ought to be practised, and materials chosen which do not emit a disagreable smell: these should consist of oil in bladders, without stench, warmed in a double vessel, or of fine salts in a bag; for millet and lineseed are smooth and pleasant

to the touch, but emit a vapour and heavy smell. The mode of using the fomentations should be the following: the patient ought to lie on his back, and the fomentations should be subjected to the tendons as far as the vertex, but not to go beyond that to the *bregma*, because this place is the common *sensorium*, and from it originates whatever is of advantage or hurt to the system. But if cataplasms are to be superadded to the tendons, the *occiput* ought to be kept in a straight direction, for if it is raised upwards, the head will be filled with the exhalations arising from the lineseed and fenugreek, which constitute the materials of the cataplasms. After the cataplasms, the application of a cupping glass to the *occiput* on both sides of the spine will be highly useful; but the flame ought to be very moderate, for the compression of the lips of the glass is both painful and excites convulsion, it is better therefore to continue the drawing for a considerable time, and rather gently, than to draw much in a short space, for by so doing the place will be made convex without any pain, which ought to be cut, and let the strength of the patient be your guide in respect of the quantity of blood to be taken.

These are the remedies of *tetanus* arising from other causes than a wound: but should the convulsion be induced by a wound, it is dangerous, and there scarcely remains any hope of safety; nevertheless it is necessary to use every endeavour, since some have been saved from the remedies applied: besides other applications, it is highly proper to moisten the ulcers by such warm substances as have already been mentioned, likewise to apply fomentations, cataplasms, and medicines, which easily excite warmth and naturally promote a quantity of *pus*, for the ulcers which take place in *tetanus* are of a squalid and dry nature. Take therefore of the manna of frankincense, the leaves of *poley*, and the resin from the turpentine and pine

trees, with the root of marshmallows, likewise rue and the herb fleabane: these must be mixed in the cataplasms, some in a liquid form, others pulverized, and some macerated in oil; the marshmallows must first be bruised, and afterwards boiled in mulse; it is necessary likewise to sprinkle castor over the ulcer, hence no small degree of heat will be diffused over the whole body, because the shiverings, which take place from the ulcers, have a bad tendency. The nostrils ought likewise to be anointed with castor oil and a mixture of the ointment of saffron; it will be proper too to drink frequently of the castor as much as is equal to the weight of three *oboli*, and if this proves nauseous to the stomach, the root of benzoin should be exhibited in quantity equal to the castor, or myrrh in half that quantity; all these ought to be drank with mulse; but if there is great abundance of the tears of benzoin which comes from *Cyrene*, as much of this as equals the bulk of a bitter vetch should be exhibited, after concealing it in a decoction of honey: in this form the patient is ignorant of its passing the palate, because it is acrid, and from its unpleasantness and bad smell excites eructations; but if it cannot be swallowed in this manner, it should be exhibited in a liquid form after dissolving it in mulse, for it is the most powerful of all other drinks which are calculated to excite warmth or moisture, to relax the distension, or soften the nerves. Yet if the patients swallow nothing, it must be given by the *anus* along with castor oil; the *anus* should likewise be anointed both with this ointment and honey; it is necessary too that the bladder should be moistened and anointed with it after it is brought to a proper consistence with wax, and if it is time for voiding the *fæces* and getting rid of flatulency, two drachms of the purgative called *hiera* ought to be injected into the *anus*, along with mulse and oil, for besides that it brings away these, it warms both the intestines and inferior *venter* from its various, warming, medicinal qualities.

Of the State in which Mercury exists, when combined with unctuous Matters: by M. Vogel.

It is known that animal fat acts more or less on several metals. Copper, for instance, gives it a green colour, when air can act jointly with it. The most important combination of this kind, however, is that of mercury with lard, in the common blue ointment of the shops. Many apothecaries have endeavoured to improve the processes for medicines of this kind, by using certain intermedia; as honey, turpentine, or rancid oil. And Fourcroy has shown that fat, when oxygenized, is better adapted for the extinction of mercury, than in the simple and recent state. But it ought to be ascertained whether any and what change in the quality of the medicine takes place in the different processes; and especially what state the mercury is in, in these combinations; some supposing it to be oxided by the friction employed in the process, while others imagine it to remain in the metallic state, and only in a state of extreme division. In order to discover which of these opinions was the true one, M. *Vogel* made the following experiments.

He triturated equal parts of lard and mercury in a mortar, which he had accurately weighed. When the mercury was completely extinguished, he weighed the mortar with the ointment in it, and found it had gained nothing. Hence he inferred, that the mercury, if oxided, must have been so at the expense of the lard, and not by the oxigen of the air.

To discover the state of the mercury, he introduced this ointment recently prepared into a cylinder of glass hermetically sealed at one end, and kept it three hours in boiling wa-

ter. After it was cold, two very distinct strata appeared, the uppermost of which was white, like lard. From this he separated the lower by cutting the cylinder with a file. On braying this gently with hot water, three drachms three grains of running mercury were collected. The remainder, which obstinately retained a little lard, was treated with a lie of caustic potash. The soap formed was dissolved in alcohol, and thus the whole of the mercury was recovered.

He likewise separated the lard from the mercury by boiling the ointment in water. The lard swam on the top, slightly coloured by a little mercury, that adhered strongly to it; and the mercury remained at the bottom of the vessel, mixed with a little lard, but the slightest agitation united its globules.

The ointment being treated with muriatic acid in close vessels, no oxigenized muriatic gas was evolved.

Ointments that had been prepared three months, eight months, and several years, being examined, a little oxided mercury was found, but the greater part was still in the metallic state.

M. Vogel likewise triturated mercury with Venice turpentine, which extinguished it with facility. The turpentine being then dissolved in alcohol, the mercury was left behind in little globules; and the alcohol being evaporated, the turpentine was recovered without any alteration in its properties.

In these ointments, therefore, the mercury is not in the state of oxide, as has generally been supposed, but merely divided very minutely. M. Vogel is likewise inclined to think, that it

is in a similar state in many mercurial compounds more or less in use, as the mercurial plaster of Vigo, ethiops saccharatus, ethiops alkalisatus, Plenck's gummy mercurial, and a number of similar mixtures. If the colour be objected, it may be observed, that antimony, however brilliant, bismuth, or any other metal capable of being powdered, becomes of a blackish grey when minutely divided.

Med. and Chir. Rev. vol. 15. *p.* lxxxi.

Method of whitening Sponges.

Suspend under a bell glass any quantity of supple, well washed, lightly moistened sponge. Then put into a glass or china saucer two or three drachms of the oxy-muriate of potash, and pour on it about an ounce of muriatic acid: place this immediately under the glass vessel along with the sponge. There is disengaged a great quantity of oxy-muriatic acid gas, which penetrates the sponge and deprives it of colour. The sponge after a time is to be withdrawn, and washed repeatedly in pure water, till deprived of the odour of the muriatic acid. Sponge thus prepared is of a beautiful light straw colour.

Ibid. p. lxxxvi.

Unfortunate Case in Midwifery.

A most lamentable case has lately occurred in the practice of midwifery in this metropolis (London), which we should not have mentioned, had it not been already made the subject of allusion in the daily newspapers. Nothing, in fact, can justify the publication of facts of this description, but the motive of

guarding others against similar errors. Medical men can never sufficiently reflect upon the importance it is of to their own comfort and reputation, as well as to the welfare of those for whom they are employed, to act in all cases with coolness and deliberation; to weigh well every step they are about to take, and its consequences; which otherwise, as in the case we are about to mention, may prove fatal to the object of their care, and to themselves a source of the most poignant regret for the remainder of their lives.

A female in the middle rank of life was delivered, without any unusual difficulty, of a healthy child, by a practitioner considerably advanced in life, whose name it would be cruelty to mention, since, however unhappy the event, there can be no doubt of his having acted with the best intentions. A small part only of the placenta was brought away, attached to the umbilical cord; the rest remaining behind in the uterus. This gave occasion to subsequent hæmorrhage, which continued to recur at times till the third day after delivery, when the practitioner being called, he judged it expedient to introduce the hand into the uterus, to unburden it of its contents. In endeavouring to effect this, the hand, either from too much violence, or possibly from a morbid state of parts, passed into the cavity of the abdomen; the body of the uterus itself, with its appendages, was brought down, and a large portion of intestine immediately followed. By some infatuation, the consequence probably of alarm and trepidation, the practitioner seems not to have been aware of the injury that had been done: mistaking them, no doubt, for the placenta and membranes, he cut off with his scissars all that had passed the os externum, including the uterus and its appendages, and several feet of intestine detached from its peritonæal coat, which was left behind.

The event was such as might have been expected: the patient died under the operator's hands. An enquiry took place by the coroner and his jury, who returned a verdict of homicide; and the matter will probably undergo investigation in a court of justice.

This terrible misfortune (for such only can it be deemed to all the parties) cannot be accounted for but by supposing the practitioner to have been confused and alarmed to such a degree as to deprive him momentarily of his faculties and feeling; for he had been a great number of years in the extensive practice of midwifery, and was held in esteem by his employers for skill and humanity; he was likewise free from every propensity to indulge in the use of strong liquors. He does not seem even to have been conscious of the mischief he had done; for not the least attempt was made at concealment, but the parts were put aside without caution, in the usual manner.

About twenty years ago, a case in many respects similar occurred to a physician of considerable eminence in this branch of the profession; with this difference, however, that the injury appears to have been committed knowingly, and for the purpose of concealment. In an attempt to turn the child, in a case of wrong presentation, the uterus burst, and the intestines came down. Convinced that the accident must prove fatal, the practitioner cut off and put in his pocket the protruded bowels, for the purpose of concealing the nature of the accident. The prying eyes of the nurse, however, discovered what had taken place; and the doctor, in order to avoid a prosecution, was compelled to abandon at once the profession and the metropolis.

It is scarcely necessary to observe what an important lesson is suggested to the practitioner of midwifery by these and similar instances; not to lose his presence of mind under circumstances of difficulty and danger, whether he regards his own reputation, or the safety of his patient. In the exercise of this branch of the profession, men are often placed in situations of peculiar difficulty and embarrassment, from which nothing can relieve them but the utmost prudence and caution. It is not so much ignorance that is to be dreaded, in these cases, as rashness and precipitancy: the latter are, indeed, much less excusable than the former.

The event above described has excited no small sensation among the gentlemen-accoucheurs of the metropolis, who have held various consultations on the subject. It has been proposed, it is said, to take advantage of the circumstance, in order to endeavour to obtain a charter for establishing an obstetric college, for the regulation of this branch of the profession. The wisdom of such a measure, however, is very questionable. Many thinking men are of opinion, that the art of midwifery has already made too great strides among us, and got into too many male hands, for the honour or reputation of the female part of the community. Midwifery is unquestionably a part, and but a small part of surgery; and ought not to be separated from it. The College of Physicians have determined wisely, in resolving to abolish, for the future, the class of licentiates in midwifery; and the College of Surgeons would, we think, do well in adopting it. It is certainly a crying sin that this branch of the art should be open to every pretender, who chuses to assume it as an introduction to ordinary practice, without giving any proofs of education or acquirements in it. Yet so it is: there is no where lodged authority to examine and license, nor a power to interdict. Let a professorship of

midwifery be attached to the Court of Examiners of the College of Surgeons, whose province it should be to examine and certify with regard to the qualifications of candidates for this branch of practice, and without whose license none should be suffered to assume it. This would sufficiently meet the evil, and is perhaps all that ought to be attempted.

Ibid. p. xcii.

Charge of Murder against an Accoucheur. From a late London Paper.

—— Williamson was indicted for the wilful murder of Anne de la Croix, in his conduct in the case of her delivery. This case, which occupied a considerable time, was in its nature too horrid to bear a minute detail. The evidence of the facts, as given by the nurse, in the outline was as follows: that the prisoner was sent for to assist the wife of Charles de la Croix, who resided in Poland-street, in her lying-in. She was delivered of the child on the 18th of September; but, some untoward symptoms following, the prisoner came again on the 20th, and then attempted to complete the delivery. From the detail, however, it appeared, that he committed a most gross error, and brought away several vital parts, the patient having expired under the operation. The nurse said, she had been at several labours with him before, and he always appeared a man of humanity, and, in this instance, he appeared to act with great kindness towards his patient; and Mrs. de la Croix was much attached to him, having often expressed herself, that she should never be happy under the hands of any other man.

Drs. Denman, Coombe, Cairne, and Boys, and Messrs. Newby and son, with Mr. Banks, professor of anatomy, seve-

rally gave an account of the injury done to the unfortunate woman, which neither delicacy nor humanity suffers us to detail. They all agreed it was most gross ignorance, and such as could hardly be accounted for in any man of common sense, not even knowing the rudiments of anatomy. Drs. Coombe and Denman said, they believed it must have been that the man having originally committed a great error, which he was afterwards sensible of, he became alarmed, confused, and lost all the powers of his mind; after which he went on at random, until he destroyed his patient.

Lord Ellenborough held, that there must be malice to constitute it a murder, and that the negligence must amount to a criminal degree of it. It would be dangerous if want of skill were to be evidence of malice, because skill was comparative. There was no doubt but this man had acted with gross ignorance; but there did not seem any circumstance to imply it was wilfully done. The jury found him *not guilty*.

Decomposition of the Fixed Alkalies.

We have to announce a discovery in chemistry by Mr. Davy, unquestionably the most brilliant that has been made since that of the decomposition of water by our celebrated countryman, Mr. Cavendish, and which opens a new and almost boundless field for future investigation. It is, doubtless, highly flattering to the feelings of Englishmen, that they should have been the authors of almost all the most important discoveries made in modern chemistry, leaving little more to our Gallic rivals than the merit of generalizing, and reducing into system,

the labours of others; fully justifying the claim to pre-eminence of freemen over slaves, in arts as well as arms; a pre-eminence which, it is to be hoped, Englishmen will always contend for and maintain.

At the late meetings of the Royal Society, a paper by Mr. Davy was read, detailing a number of experiments, in which he succeeded in decomposing the fixed alkalies, substances which have hitherto been ranked among elementary bodies. By means of a most powerful galvanic apparatus, both potash and soda were decomposed. This was effected by placing the moistened salt on a plate of platina, and exposing it to the galvanic action. Oxygen gas was disengaged, and small globules were perceived, of a metallic appearance, and similar to the globules of mercury. Upon examination, they were found to possess all the properties of a metal, but of a very peculiar kind.

The specific gravity of these globules, as procured from potash, was considerably less than that of distilled water, and they were found to swim even in distilled naphtha. At the freezing point of water (32° F.) they were hard and brittle; at 40° they could scarcely be distinguished from quicksilver; at 60° they were fluid; and at 100° volatile. One of the most striking properties of this new metal is its inflammability, in which respect it exceeds even phosphorus. When exposed to the atmosphere, it rapidly imbibes oxygen, and re-assumes its alkaline character; it takes oxygen from water, and even from alkohol; so that the only fluid in which it can be kept is naphtha.

Mr. Davy afterwards proved the metallic nature of this new substance, by amalgamating it with different metals. One part by weight of this new metal, with forty-eight of mercury,

formed an amalgam, which, when applied in the circle of a galvanic battery (that produced an intense heat) to iron, silver, gold, or platina, immediately dissolved these, and converted them into oxides, in which process alkali was regenerated. Glass, as well as all other metallic bodies, was also dissolved by the application of this substance: the base of the alkali seizing the oxygen of the manganese and of the minium, potash was regenerated. One of the globules placed on a piece of ice dissolved it, and burnt with a bright flame, giving out an intense heat. Potash was then found in the dissolved ice. Nearly the same effects followed when a globule was thrown into water; and in both cases a great quantity of hydrogen gas was liberated. When laid on a piece of moistened turmeric paper, the globule seemed instantly to acquire intense heat; but so rapid was its movement in quest of the moisture, that no part of the paper was burnt, only an intense deep red stain marked the course it followed, showing a reproduction of alkali.

Soda, submitted to the same train of investigation, gave results very similar; but the metallic base was found to possess some peculiar properties. Its specific gravity was rather greater than that of the base of potash. It was fixed at a temperature of 150°, and fluid at 180°.

From the medium of numerous analytical and synthetical experiments, it appeared that 100 parts of potash consist of 15 oxygen, and 85 of the inflammable base or metal; while the same quantity of soda contains 20 of oxygen, and 80 of the base.

Mr. Davy afterwards examined the volatile alkali, which is commonly considered as consisting of hydrogen and nitrogen:

he found, by numerous experiments, that oxygen is likewise a constituent part of this alkali, 100 grains of the latter yielding 20 of oxygen.

Other experiments served to convince Mr. Davy that oxygen is a constituent principle in the muriatic and fluoric acids, which chemists have been hitherto unable to decompose. He likewise examined some of the primitive earths, as they are called, particularly barytes and strontites, both of which yielded considerable quantities of oxygen. This renders it probable that these and the other alkaline earths which resemble the alkalies so strongly, are, like these, compounded bodies, each with its peculiar base.

These novel and interesting facts show the necessity of reforming the nomenclature of chemistry. If oxygen really be an essential ingredient in the constitution of the alkalies, as the experiments above alluded to leave no room to doubt, the impropriety of the term oxygen is manifest.

Med. and Chir. Rev. vol. 16. *p.* x.

Harrup's Ideas of Atmospheric Oxygen unfounded.

Mr. Robert Harrup, of Cobham, Great Britain, has asserted, in the fifth volume of Nicholson's Chemical Journal, that the oxigenous portion of atmospheric air is supplied by the decomposition of water, by means of light and azotic gas.

He exposed azotic air to the action of light and pump water for several months, and declares, that, at the expiration of this time, he procured an air purer than that of the atmosphere.

This experiment has been repeated, without success, by Dr. Woodhouse. The doctor exposed a number of bell glasses, containing distilled water and azotic air, confined by mercury, to the action of solar light for several months, and did not find the air in the least altered.

It is well known that pump water contains oxygen gas.

If there was a decomposition of water in Mr. Harrup's experiment, what becomes of its hydrogen?

Antediluvian Vaccination!

Dr. Valentine, of Marseilles, has lately informed Dr. Rush, by letter, that Mr. Cherreuse, an apothecary and botanist at Metz, in the department of Mozelle, had vaccinated a child of four years old, in which the disease did not appear upon the arm until *one year* afterwards, when it ran its course with its usual appearances and order!!!!

Gold Medal Prize.

The Medical Lyceum of Philadelphia, desirous of promoting the investigation of physiology, offer a gold medal, of the value of fifty dollars, to the author of the best essay on the following question:

"Does the human body possess the power of absorbing substances applied to its surface?"

The essay must be written in the English language, and delivered to the corresponding secretary of the Lyceum, on or before the first day of January, 1809, with a sealed paper, containing the name of the author, which paper shall not be opened, unless the medal is adjudged to the essay it accompanies.

Editors of newspapers, medical, or other periodical works, are requested to promote the publicity of this through the medium of their several publications.

J. C. Rousseau, M. D. *Corresponding Secretary.*

Philadelphia, Feb. 5th, 1808.

Observations on the Plagiarisms of the Editors of the London Medical and Physical Journal.

In many occurrences of life, there is a point, when our rights are invaded, and due attention is not paid to justice, beyond which silence becomes criminal. Such a point the editors of the London Medical and Physical Journal have now reached; and a sense of what is due to myself, compels me, unwillingly, to expose the conduct of persons who certainly know the common principles of rectitude due from one editor to another. I have, in some of the preceding numbers of the Museum, declared my intention of exposing their plagiarisms; and I cannot but think every friend of justice will allow that I act with propriety, in endeavouring to arrest such improper proceedings. I would ask these editors, what difference they can perceive between robbing a person of his literary or other property? When due credit is given for the sources from whence their publication proceeds, I certainly shall not complain; but seeing, as is the case, whole volumes of the Medical Museum gutted to supply their

wants, without the slightest acknowledgment for the same; and when I see some of the most valuable parts of their work composed of my materials, without saying whence obtained; I must consider it high time to notice such proceedings, in which every honourable editor is as much interested as myself.

But this is not the whole; a more serious fault still remained for the editors of the London Medical and Physical Journal to employ, and which I have detected, in number 107, of their work, which has just reached me. I mean, that of altering words in a communication, so as to make it appear, that the paper taken from the Medical Museum, was sent to them. What can be the reason of their omitting, except when they could not avoid it, crediting my work with their extracts, is best known to themselves; but as it has reached that pass, that papers printed by me are published as sent to them, it becomes my duty to unveil this deceit, as much in justice to their respectable subscribers, as to myself. I shall therefore here briefly enumerate the documents which they have taken from me. I find the editors of the New York Medical Repository have the same cause of complaint with myself, and shall be happy in their co-operation to prevent this unjust and ungenerous procedure. I have only to add, that I shall certainly not hesitate, if this mode is continued, to send over an account of it to the public papers in London, that the readers of the Journal may know the source from which many of the communications they read, are derived.

In Vol. XIV. we have Dr. John Rush's case of resuscitation.

Dr. Benjamin Rush's paper on sugar of lead in epilepsy.

Dr. Otto, on arsenic in three cases of eruption.

And a paper on tetanus, by the editor.

Of these papers, comprising about fourteen pages, only that of Dr. Otto is acknowledged as taken from the Museum; and the case of tetanus is a second time introduced, into their XVIIIth volume, without acknowledgment.

Vol. XVII. Dr. Barstow's account of the singular effects of the bite of a rattle-snake.

Dr. Dewees's essay on superfœtation.

Dr. Pascalis's case of abscess of the liver.

Dr. Watkins, on yeast in typhus fever.

All these, of nearly fourteen pages, have no acknowledgment.

Vol. XVIII. Dr. Ffirth, on nitric acid in hepatitis.

Dr. Coxe, on a case of burn (second time).

Dr. Rousseau, on the resuscitation of a new-born child.

Dr. Smith's case of hemoptoe.

Dr. Watson, on mercury in consumption.

Dr. Stringham, on the diuretic effects of mercury.

Dr. Shaw's case of wounded lungs.

Dr. Dewees, on blood-letting in difficult parturition.

Dr. Coxe, on tinea capitis.

Dr. Elmer, on mortification of the uterus.

Dr. Budd's case of disease from corrosive sublimate.

Dr. Shaw, on tobacco bougies.

A. B. on puerperal convulsions.

Dr. Spence, on saccharum saturni in epilepsy.

Dr. Dorsey's case of wounded brain.

Mr. Johnson, on fever, &c. relieved by electricity.

Dr. Sayre, on worms in the vagina and ear.

Dr. Coxe, on tetanus (second time).

Dr. Physick, on blisters in mortification.

—— Jennings, on labour in phthisis.

Dr. Dewees, on parturition.

Case of wounded intestines.

Of the above, about one-half are acknowledged; the remainder are not.

Vol. XIX. (Nos. 1. & 2.) Dr. M'Dowel, on the cure of consumption by mercury.

Dr. Harris's case of hydrocephalus.

Dr. Rush, on the cure of phthisis by opium, &c.

Dr. Vaughan*, on olive-oil as a purgative, &c. &c.

Dr. Stuart, on the injurious effects of leeches.

Dr. Mitchell, on saccharum saturni in uterine hemorrhage.

Dr. Auld, on the cure of bilious fever by nitric acid.

* This is the paper introduced as written to them.

Dr. Mease, on mercury in typhus and tetanus.
Dr. Mease, on rousing the excitability by the cold bath.
Dr. Humphries, on palsy cured by lightning, &c.
Observations on diseases subsequent to measles, &c. &c.
Dr. Smith, on a disease of the stomach, &c.
Dr. Wadsworth's account of a dissection.
None of these are acknowledged.

It would appear, that considerably more than one-half of the above papers are printed without any acknowledgment of the source whence derived; and I have only made this claim to my own rights, from a perfect conviction of my having endeavoured, in every instance, to do justice to the sources from which I have borrowed for the Medical Museum.

I have said nothing of the mutilation of some of the papers, by which portions are omitted which might lead to a knowledge of the source of the communication.

At a meeting of the Medical Society of the state of New York, holden at the City-Hall of the city of Albany, on the first Tuesday of February, 1808, the following physicians were elected to the offices annexed to their respective names:

Dr. NICHOLAS ROMEYNE, *President.*
Dr. ALEXANDER SHELDON, *Vice-President.*
Dr. JOHN STEARNS, *Secretary.*
Dr. JAMES G. GRAHAM, *Treasurer.*

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- Dr. John Ely,
- Dr. Alexander Sheldon,
- Dr. Jesse Shepherd,
- Dr. Reuben Hart,
- Dr. Barnabas Smith,

Memoirs of the Life and Character of JOHN REDMAN, M. D.

DR. JOHN REDMAN was born in Philadelphia, on the 27th of February, 1722. His parents early destined him to fill one of the liberal professions, for which purpose he was sent to the Rev. Mr. Tennent's academy, at Neshaminey, in Bucks county, where he acquired a correct knowledge of the Latin and Greek languages, and a general acquaintance with such of the sciences as were then taught in public schools. His companions and schoolmates in this academy, were his preceptor's sons, the Rev. Gilbert, William, and Charles Tennent, the Rev. Daniel Lawrence, and the Rev. Dr. Rogers, of New York, with all of whom, during their lives, he kept up a friendly intercourse. After finishing his academical education he entered upon the study of physic with Dr. John Kearsely, then one of the most respectable physicians in Philadelphia. He served his master faithfully, and acquired, during the period of his studies, the esteem and confidence of all his patients. After the expiration of his apprenticeship, he went to the island of Bermuda, where he exercised his profession for several years, and acquired so much money as enabled him, with the property he inherited from his father, and a small loan from his relation, judge Allen, to proceed from thence to Europe, for the purpose of completing his studies in medicine. He spent a year in Edinburgh, while the medical school of that city was in the hands of the first Monroe, Sinclair, Alston, Plummer, and Rutherford. He likewise passed a year in attending Guy's Hospital*, and some time in attending lectures, dissec-

* The following is a copy of a certificate of his attendance upon that hospital:

"We think the character of Dr. John Redman so much deserves our approbation, that it is with pleasure we can say, that after having spent a conside-

tions, and hospitals in Paris. Copies of the lectures of the above professors, and notes of the cases which occurred in the hospitals, while he attended them, are now in the possession of his grandson, Dr. John Redman Coxe, written with singular correctness and perspicuity. He graduated in the University of Leyden, on the 15th of July, in the year 1748, under the celebrated Albinus, Gaubius, and Musschenbroek, and at a time when that seminary retained a large portion of the reputation it had derived from the illustrious name of Dr. Boerhaave. The subject of his inaugural dissertation was "Abortion," which he handled with great learning and ingenuity. Few better essays upon that subject are to be met with in any language. The conclusion of this dissertation strongly indicates the piety which distinguished the early part of his life:

"Faxit Deus Ter Opt. Max. ut hæcce mea studia et conamina dirigantur in nominis sui gloriam, proximorumque salutem*."

After receiving the highest medical honours in his profession, he returned to his native country, and settled in Philadelphia. He soon succeeded in business, and, in the course of a few years, ranked among the oldest physicians in the city, in point of celebrity in medicine. For a while he practised surgery and midwifery; but, finding the labours of those branches of medicine

rable time in the universities of Edinburgh and Leyden, in which last he had the degree of doctor of physic conferred on him, and made all the improvements necessary to the knowledge of physic, he has with great application attended the practice of this hospital, by which means he has so well qualified himself, that we doubt not his future success will answer to the care and pains he has taken to deserve it. (Signed) —— Clarke, M. D.
Guy's Hospital, Chars. Feake, M. D.
Feb 21, 1748-9. N. Munckley, M. D.

* God grant that my studies and labours may be directed to the glory of his name, and to the welfare of my neighbours.

incompatible with the delicacy of his health, he declined them, and confined himself exclusively to the practice of physic.

His principles in medicine were derived from the writings of Dr. Boerhaave, but his practice was formed by the rules of Dr. Sydenham. He early saw that the modes of practice which were recommended by that enlightened physician, in the seventeenth century, in England, were equally proper, in the eighteenth century, in America, from the sameness of the manners of the inhabitants of both countries, in those different periods of time. He saw distinctly the truth of Dr. Sydenham's remarks upon the laws of epidemics, and regulated his practice by them. He considered a greater *force* of medicine necessary to cure modern American, than modern British diseases, and hence he was a decided friend to depletion in all the violent diseases of our country. He bled freely in the yellow fever of 1762, and threw the weight of his venerable name into the scale of the same remedy in the year 1793. In the diseases of old age, he considered small and frequent bleedings as the first of remedies; and to them he was indebted for much of the ease he enjoyed in his descent down the hill of life. Towards the close of his life, he read the works of Cullen, Brown, and several other physicians, who had called in question the truth of Dr. Boerhaave's principles in medicine. He admitted their objections, and embraced some of the modern opinions and modes of practice, with the avidity of a young man of five and twenty. He published, about the year 1759, a defence of inoculation, and advised the use of mercury to prepare the body for the reception of the small-pox. He entertained a high opinion of that heroic medicine in all chronic diseases. He gave it in the natural small-pox, with a view of touching the salivary glands about the turn of the pock, a time in which patients often die, from the whole force of the disease falling upon the wind-pipe and lungs. He introduced the use of turbeth mineral as an emetic in the gangrenous sore throat of

1764; and, such was its efficacy, that he did not lose a patient who took it in the early stage of that epidemic.

About the fortieth year of his age, he was afflicted with an abscess in his liver, the contents of which were discharged by expectoration through his lungs. He was frequently confined by acute diseases, and suffered much from the rheumatism as he advanced in years. These facts are mentioned to show, that frequent attacks of violent diseases, when treated properly, do not prevent the attainment of extreme old age.

His fellow-citizens, and his medical brethren, were not insensible of his merit. He was elected one of the physicians of the Pennsylvania Hospital immediately after its establishment, and afterwards the first president of the College of Physicians of Philadelphia. He discharged the duties of these stations faithfully, and reluctantly retired from them, in consequence of the weakness and infirmities of age. He served as a trustee of the colleges of Philadelphia and New Jersey for many years, and more than once refused to stand a candidate for a seat in the legislature of Pennsylvania, before the American revolution.

He was faithful and punctual in his attendance upon his patients. In a sick room he possessed virtues and talents of a specific kind. He suspended pain by his soothing manner, or chased it away by his conversation, which was occasionally facetious and full of anecdotes, or serious and instructing, according to the nature of his patients' diseases, or the state of their minds. A lady, whom he attended in a fatal consumption, said to one of her friends, that "death had nothing terrible in it when Dr. Redman spoke to her about it." The respectability of his character as a physician will derive a lustre from the history of his domestic and religious character.

He married Miss Mary Sobers, a lady of uncommon talents and accomplishments of mind and body, soon after he settled in Philadelphia, by whom he had two sons and two daughters. His sons died in their infancy. In the year 1770, his elder

daughter married Daniel Coxe, Esq. one of the king's counsel of New Jersey. This gentleman adhered to the royal party during the American revolution, in consequence of which he went to England, whither he was followed by his wife and children, in the year 1785. The separation of this daughter was to her father a most poignant affliction. He accompanied her with tears to the vessel that conveyed her from his sight; but his distress was soon alleviated by the suggestions of religion. These he expressed the next day to a friend, whom he informed, that his mind had been composed by reflecting upon the following words of our Saviour: "He that loveth father or mother more than me, is not worthy of me; and he that loveth son or daughter more than me, is not worthy of me."

He was remarkably attached to all the branches of his family, even to those who were distantly related to him, or who were in indigent circumstances. His only brother, Joseph Redman, formerly a merchant in Philadelphia, partook of his affections in an uncommon degree. He died in the autumn of 1779. The doctor sat in the room with his corpse, while the company were assembling to attend his funeral. Just before the lid of his coffin concealed him for ever from his sight, the doctor rose from his seat, and, grasping the lifeless hand of his brother, he turned round to his children, and other relatives in the room, and addressed them in the following words: "I declare, in the presence of God, and of this company, that, in the whole course of our lives, no angry word nor look has ever passed between this dear brother and me." He then kneeled down by the side of his coffin, and, in the most fervent manner, implored the protection and favour of God to his widow and children.

In the early and midle stages of his life, he was not ashamed of the gospel of Christ, and liberally contributed to its support; but the evening of his life was the meridian of his piety. Being easy in his circumstances, and feeling the labours of his

profession incompatible with his health, he early declined business; but it was to engage in business of another kind. He was elected an elder of the Second Presbyterian Church, in the year 1784. The duties of this office gave him both employment and delight. He gave secretly and liberally to the poor, from a principle of charity, and, when confined by sickness, he conveyed his bounty to them by the hands of a friend. He visited his old patients regularly two or three times a-year, and always left behind him some pious remarks, or anecdotes, that were not soon forgotten. His conversation was facetious, animated, free from the querulousness of old age, and always seasoned with the grace of the gospel. In his own house he passed his time chiefly in reading books of devotion, and in other religious exercises. He thought humbly of himself, and often lamented his slender attainments in religion. For some years before his death, he heard and read with difficulty, from the decay of his hearing and eye-sight; but, under the pressure of these evils, he was so far from complaining, that he was constantly finding out reasons why he should be contented and thankful. Such was the natural cheerfulness of his temper, that upon serious subjects he was never grave. He spoke often of death, and of the scenes which await the soul after its separation from the body, with the same composure that some men speak of going to bed, or visiting a new and pleasant country. It remains only to be added under this head, that he was a stranger to bigotry, and that he often worshipped with sects of christians that differed in principle and forms from the one with which he was united.

With all the virtues and piety which have been ascribed to him, it would be unjust to conceal, that he possessed, in the early and middle stages of life, a quick and irritable temper. But the sun never went down upon his anger; and to his pupils and servants, he has been known to make acknowledgments for even a hasty expression. The admission of this infirmity

in the character of Dr. Redman will make it necessary to distinguish between a passionate temper, and a bad disposition. The former is a transient emotion, and often exists with candour, sincerity, and benevolence. The latter is a settled principle, and vents itself in cool and protracted acts of malice and revenge.

In the month of December, 1806, his younger daughter died. She had lived with her parents for fifty years, and secluded herself from society, in order to soothe their declining years. Her death left them in a state of the most distressing solitude, and at a time when they were least able to bear it. His elder daughter, who had been separated from him nearly four and twenty years, upon hearing of the death of her sister, immediately tore herself from her husband and children, and crossed the ocean, to alleviate, by her presence, the grief of her bereaved parents. Her arrival exhibited a scene of joy such as seldom occurs in domestic history. The good old man said to a friend, upon this occasion, "that he had formerly owed ten thousand talents to his Maker, but that his debt had increased so much by the arrival of his daughter, that he was determined to become bankrupt, and throw himself entirely upon the mercy of his divine creditor." The lamp of life, which was nearly extinguished in him and his wife, suddenly blazed forth upon this occasion; but it was only to consume the oil which fed it with the more rapidity. Mrs. Redman died on the 29th of November, two months after the sight of her daughter, in the eighty-fourth year of her age. The distress occasioned by this event was severely felt by her husband. They had passed nearly sixty years together, in the most uninterrupted harmony. She was his best friend, and wisest counsellor, in all the trials and difficulties of his life.

His affections now centered themselves wholly in his surviving daughter: but time and nature forbade the long duration of this last portion of social happiness. On Friday, the 18th

of March, he took a walk to his grandson's. In the afternoon, he discovered an unusual degree of sprightliness in his conversation. After drinking tea, he rose to light a candle, in order to go into an adjoining room. In attempting to walk, he staggered, and was led to a chair by his daughter. He squeezed her hand, and gave her a look which indicated his belief, that the time of his departure had arrived. His disease immediately assumed all the symptoms of apoplexy, of which he died without pain, and apparently without the least consciousness of his situation, about five o'clock the next day, aged eighty-six years and twenty days. It would seem, from the easy manner in which he expired, that the messenger of death had been instructed to blindfold him, in order to conceal from his view the dreary objects which sometimes surround the passage out of life.

He was buried, at his request, in the presbyterian churchyard, in Arch-street, exactly in the same spot in which his mother had been interred, fifty years before him. This attachment to the dust of our ancestors, though a deep seated principle in human nature, is seldom felt, except in old age, or in the hour of death. Its extent is universal. Its final cause is no doubt a wise one, but this is not the place to inquire into it.

To those who may read the account that has been given of this excellent physician, and eminent christian, without knowing him, it may not be amiss to add, that he was somewhat below the middle stature; his complexion was dark, his eyes black, and uncommonly animated; and his manner, both in gesture and speech, such as indicated a mind always busy, and teeming with new and original conceptions of human and divine things.

The Editor must request those gentlemen who favour him with communications, and also those who occasionally send to him for vaccine matter, to pay the postage, which is often neglected, and amounts to several dollars in the course of a year. He has now on hand, one from a distant state, which cost him seventy-five cents.

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